

CHILDHOOD ASTHMA AND AIR POLLUTION: DO FINDINGS VARY BY WARM AND COLD SEASONS?

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Background and Aims: Ambient air pollution has been associated with asthma outcomes in children in time series analyses that control for season. In this study, we examine the effects of air pollution on acute outpatient visits for childhood asthma separately for warm and cold months to assess whether the associations vary by season.

Methods: Data sources are daily acute respiratory visits from a nonprofit managed care organization and air pollution measures from a centrally-located air monitoring site, both in Atlanta, GA, USA. Acute visits are appointments made on the same day the visit was completed. Pollutants included in this analysis are: PM_{2.5}, PM₁₀, Coarse PM, OC, EC, PM_{2.5} water-soluble (ws) metals, coarse ws metals; PM_{2.5} Zn, ws Cu, ws Fe, and ws Mn; and coarse PM ws Cu, ws Fe, and ws Mn. Poisson GLM was employed to determine the relationships between lagged pollutants (0 -2, 3-5, and 6-8 day moving averages) and acute visits. The warm season months were defined as April through October, while cold season was November through March.

Results: For the warm season, we found one significant positive association for a 3-day moving average lag: OC (lag 3-5). For single day lags, we also found significant positive associations for PM₁₀ (lag 4), OC (lag 4), and PM_{2.5} (lag 4). For the cold season, there were no significant positive associations, but two significant negative findings both for lag 0: OC and PM_{2.5}. Compared to the overall 116-month findings that controlled for season, PM₁₀ (lag 4) was significant in both analyses.

Conclusions: These findings show seasonal variation in associations between childhood asthma and ambient air pollution. More pollutants are significant in the warm season, with positive effects. Separate models for warm and cold months may be more informative in some cases than controlling for season. Presented findings will include additional pollutants for a 120-month time period.